Magnetostriction assessment of power transformer (a case study of 30/40MVA, 132/33 kV transformer at Bauchi substation)

Abstract :

A lot of things determine the life expectancy of a transformer such as overheating due to triplen harmonics, unbalanced loading, vibro-acoustic noise and so on. For this reason, this paper presents the investigation carried out on the magnetostrictive sound of Bauchi, 30/40 MVA, 132/33 KV substation transformer. Readings were taken using standard audio recording instrument for various loading and voltage conditions in the mornings, afternoons and nights for six days and the offline assessment was carried out using digital spectrum analyzer. However, no access could be gained to the variation of certain important parameters, like changing of core dimensions, loosing or tightening of core and so on, for the substation transformer in-situ in the substation hence separate laboratory test transformers were used in the assessment of the effect of core damping pressure, construction looseness and transformer saturation on the vibro-acoustic noise. Conclusively, increasing the operation voltage of transformer tends to produce more magnetostriction effect while loosening core lamination increases the energy losses.